

Germination and Bulb Formation of *Allium tuncelianum* L. under in vitro Condition

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Abstract : Genus *Allium* includes 600 to 750 species and most of these including *Allium tuncelianum* (Kollman) N. Ozhatay, B. Mathew & Siraneci; Syn; *A. macrochaetum* Boiss. and Hausskn. subsp. *tuncelianum* Kollman] or Tunceli garlic is endemic to Eastern Turkish Province of Tunceli and Munzur mountains. They are edible, bear attractive white-to-purple flowers and fertile black seeds with deep seed dormancy. This study aimed to break seed dormancy of Tunceli garlic and determine the conditions for induction of bulblets on these seeds and increase their diameter by culturing them on MS medium supplemented different strengths of KNO₃. Tunceli garlic seeds were collected from field grown plants. They were germinated on MS medium with or without 20 g/l sucrose followed by their culture on 1 × 1900 mg/l, 2 × 1900 mg/l, 4 × 1900 mg/l and 6 × 1900 mg/l mg/l KNO₃ supplemented with 20 g/l sucrose to increase bulb diameter. Improved seeds germination was noted on MS medium with and without sucrose but with variation compared to previous reports. The bulb development percentage on each of the sprouted seeds was not parallel to the percentage of seed germination. The results showed 34% and 28.5% bulb induction was noted on germinated seeds after 150 and 158 days on MS medium containing 20 g l⁻¹ sucrose and no sucrose respectively showing a delay of 8 days on the latter compared to the former. The results emphatically noted role of cold stratification on agar solidified MS medium supplemented with sucrose to improve seed germination. The best increase in bulb diameter was noted on MS medium containing 1 × 1900 mg/l KNO₃ after 178 days with bulblet diameter and bulblet weight of 0.54 cm and 0.048 g, respectively. Consequently, the bulbs induced on sucrose containing MS medium could be transferred to pots earlier. Increased (>1 × 1900 mg/l KNO₃) strengths of KNO₃ induced negative effect on growth and development of Tunceli garlic bulbs. The strategy of seed germination and bulblet induction reported in this study could be positively used for conservation of this endemic plant species.

Keywords : Tunceli garlic, seed, dormancy, bulblets, bulb growth

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